INTER-AMERICAN TROPICAL TUNA COMMMISSION
COMISIÓN INTERAMERICANA DEL ATÚN TROPICAL

QUARTERLY REPORT—INFORME TRIMESTRAL

October-December 2005
Octubre-Diciembre 2005

COMMISSIONERS—COMISIONADOS

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The

QUARTERLY REPORT

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of the

INTER-AMERICAN TROPICAL TUNA COMMISSION

is an informal account, published in English and Spanish, of the current status of the tuna fisheries in the eastern Pacific Ocean in relation to the interests of the Commission, and of the research and the associated activities of the Commission's scientific staff. The research results presented should be regarded, in most instances, as preliminary and in the nature of progress reports.

El

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es un relato informal, publicado en inglés y español, de la situación actual de la pesca atunera en el Océano Pacífico oriental con relación a los intereses de la Comisión, y de la investigación científica y demás actividades del personal científico de la Comisión. Gran parte de los resultados de investigación presentados en este informe son preliminares y deben ser considerados como informes del avance de la investigación.

Editor—Redactor:
William H. Bayliff

INTRODUCTION

The Inter-American Tropical Tuna Commission (IATTC) operates under the authority and direction of a convention originally entered into by Costa Rica and the United States. The convention, which came into force in 1950, is open to adherence by other governments whose nationals fish for tropical tunas and tuna-like species in the eastern Pacific Ocean (EPO). Under this provision Panama adhered in 1953, Ecuador in 1961, Mexico in 1964, Canada in 1968, Japan in 1970, France and Nicaragua in 1973, Vanuatu in 1990, Venezuela in 1992, El Salvador in 1997, Guatemala in 2000, Peru in 2002, Spain in 2003, and the Republic of Korea in 2005. Canada withdrew from the IATTC in 1984.

The IATTC's responsibilities are met with two programs, the Tuna-Billfish Program and the Tuna-Dolphin Program.

The principal responsibilities of the Tuna-Billfish Program specified in the IATTC's convention were (1) to study the biology of the tunas and related species of the eastern Pacific Ocean to estimate the effects that fishing and natural factors have on their abundance and (2) to recommend appropriate conservation measures so that the stocks of fish could be maintained at levels that would afford maximum sustainable catches. It was subsequently given the responsibility for collecting information on compliance with Commission resolutions.

The IATTC's responsibilities were broadened in 1976 to address the problems arising from the incidental mortality in purse seines of dolphins that associate with yellowfin tuna in the EPO. The Commission agreed that it "should strive to maintain a high level of tuna production and also to maintain [dolphin] stocks at or above levels that assure their survival in perpetuity, with every reasonable effort being made to avoid needless or careless killing of [dolphins]" (IATTC, 33rd meeting, minutes: page 9). The principal responsibilities of the IATTC's Tuna-Dolphin Program are (1) to monitor the abundance of dolphins and their mortality incidental to purse-seine fishing in the EPO, (2) to study the causes of mortality of dolphins during fishing operations and promote the use of fishing techniques and equipment that minimize these mortalities, (3) to study the effects of different modes of fishing on the various fish and other animals of the pelagic ecosystem, and (4) to provide a secretariat for the International Dolphin Conservation Program, described below.

On June 17, 1992, the Agreement for the Conservation of Dolphins ("the 1992 La Jolla Agreement"), which created the International Dolphin Conservation Program (IDCP), was adopted. The main objective of the Agreement was to reduce the mortality of dolphins in the purse-seine fishery without harming the tuna resources of the region and the fisheries that depend on them. This agreement introduced such novel and effective measures as Dolphin Mortality Limits (DMLs) for individual vessels and the International Review Panel to monitor the performance and compliance of the fishing fleet. On May 21, 1998, the Agreement on the International Dolphin Conservation Program (AIDCP), which built on and formalized the provisions of the 1992 La Jolla Agreement, was signed, and it entered into force on February 15, 1999. In 2004 the Parties to this agreement consisted of Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, the United States, Vanuatu, and Venezuela, and Bolivia, Colombia, and the European Union were applying it provisionally. These were "committed to ensure the sustainability of tuna stocks in the eastern Pacific Ocean and to progressively reduce the incidental mortalities of dolphins in the tuna fishery of the eastern Pacific Ocean to levels approaching zero; to avoid, reduce and minimize the incidental catch and the discard of juvenile tuna and the incidental catch of non-target species, taking into consideration the interrelationship among species in the ecosystem." This agreement established Stock Mortality Limits, which are similar to DMLs except that (1) they apply to all vessels combined, rather than to individual vessels, and (2) they apply to individual stocks of dolphins, rather than to all stocks of dolphins combined. The IATTC provides the Secretariat for the International Dolphin Conservation Program (IDCP) and its various working groups and panels and coordinates the On-Board Observer Program and the Tuna Tracking and Verification System (both described later in this report).

At its 70th meeting, on June 24-27, 2003, the Commission adopted the Resolution on the Adoption of the Convention for the Strengthening of the Inter-American Tropical Tuna Commission Established by the 1949 Convention between the United States of America and the Republic of Costa Rica ("the Antigua Convention"). This convention will replace the original one 15 months after it has been ratified by seven signatories that are Parties to the 1949 Convention. It was ratified by Mexico on January 14, 2005, and by El Salvador on March 10, 2005.

To carry out its responsibilities, the IATTC conducts a wide variety of investigations at sea, in ports where tunas are landed, and in its laboratories. The research is carried out by a permanent, internationally-recruited research and support staff appointed by the Director, who is directly responsible to the Commission.

The scientific program is now in its 55th year. The results of the IATTC staff's research are published in the IATTC's Bulletin and Stock Assessment Report series in English and Spanish, its two official languages, in its Special Report and Data Report series, and in books, outside scientific journals, and trade journals. Summaries of each year's activities are reported upon in the IATTC's Annual Reports and Fishery Status Reports, also in the two languages.

SPECIAL NOTICE

We are pleased to announce that the Republic of Korea deposited its instrument of adherence to the 1949 convention of the IATTC and its instrument of accession to the 2003 "Antigua Convention" on December 13, 2005, increasing the number of members from 14 to 15.

The European Union, which had been provisionally applying the Agreement on the International Dolphin Conservation Program since 1999, ratified this agreement on December 22, 2005. Thirteen countries have now ratified or acceded to that agreement, and two others are provisionally applying it.

MEETINGS

IATTC and AIDCP meetings

The following IATTC and AIDCP meetings were held in La Jolla, California, during October 2005. Information on these meetings is available on the IATTC's web site.

No.	Meeting	Date
3	Scientific Advisory Board	October 17
20	Permanent Working Group on Tuna Tracking	October 18
6	Working Group to Publicize the Dolphin Safe Tuna Certification System	October 18
40	International Review Panel	October 19
14	Parties to the AIDCP	October 20

Dr. Mark N. Maunder organized an IATTC Workshop on Stock Assessment Methods, which was held in La Jolla, California, on November 7-11, 2005. He and Dr. Richard B. Deriso served as co-chairmen for the meeting. Representatives of the Billfish Foundation, the Centro de Investigación Cientifica y de Educación Superior of Mexico, the Columbia River Inter-Tribal Fish Commission, the Department of Fisheries and Oceans of Canada, the National Institute of Water and Atmospheric Research of New Zealand, the National Research Institute of Far Seas Fisheries of Japan, National Taiwan University, the Comisión Permanente del Pacífico Sur, the Rosenstiel School of Marine and Atmospheric Science, University of Miami, the Secretariat of the Pacific Community, Sustainable Fishery Advocates, the U.S. National Marine Fisheries Service, and the University of California at Santa Cruz, plus Drs. Michael G. Hinton and Cleridy E. Lennert-Cody, and Messrs. Simon D. Hoyle and Patrick K. Tomlinson of the IATTC staff, participated in the workshop. Dr. Maunder gave the following presentations:

Do we need to integrate across random effects (*e.g.* recruitment deviates) and estimate standard deviations?

How to estimate uncertainty: Bayesian; profile likelihood; bootstrap; model uncertainty;

How to include environmental data;

How to perform forward projections;

Can the general models be used for protected species?

Including prior information;

A-SCALA.

Other meetings

Dr. Daniel Margulies participated in a meeting of the Early Life History Working Group of the Climate Impacts on Oceanic Top Predators (CLIOTOP) Program in Málaga, Spain, on October 9-14, 2005. The meeting, which was hosted by the Instituto Español de Oceanografía, included presentations and discussion of early life history research on tunas conducted in multiple ocean systems by scientists in Italy, Japan, Panama, Spain, and the United States. Dr. Margulies made several presentations summarizing the IATTC research program on early life history of yellowfin at the Achotines Laboratory. The results of the meeting will be developed into a research plan to identify priority topics for joint study and funding proposals as part of the overall CLIOTOP science plan.

Dr. Richard B. Deriso participated in a meeting of the Scientific and Statistical Committee of the Western Pacific Fishery Management Council of the United States in Honolulu, Hawaii, on October 18-20, 2005. His travel expenses were paid the by the Western Pacific Fishery Management Council.

Dr. Mark N. Maunder participated in a workshop at the Centre for Ecological and Evolutionary Synthesis of the University of Oslo on October 19-21, 2005, for the project "Integrated statistical analysis based on likelihood and confidence: applications to the hare-lynx population cycles and the status and structure of bowhead whales." He made two presentations, "Review of integrated analysis in fisheries stock assessment" and "Incites into Bayesian analysis" (misspelling intentional). His expenses were partially covered by the Centre for Ecological and Evolutionary Synthesis.

Drs. Robin Allen, Richard B. Deriso, Michael G. Hinton, and Mark N. Maunder and Messrs. Kurt M. Schaefer and Daniel W. Fuller attended all or parts of the Fourth International Billfish Symposium, held at Avalon, California, on October 31-November 3, 2005. Dr. Allen was chairman of a session on management, and four papers coauthored by Drs. Hinton, Maunder, and Robert J. Olson were presented at the symposium. Many of the papers presented will be published in the Bulletin of Marine Science.

Dr. Daniel Margulies participated in part of the 34th Aquaculture Panel Meeting of the US-Japan Cooperative Program in Natural Resources (UJNR), held in San Diego, California, on November 6-11, 2005. The meeting was sponsored by the U.S. National Oceanic and Atmospheric Administration and the Japanese National Research Institute of Aquaculture of the Japan Science and Technology Agency. Dr. Margulies presented a paper entitled "Captive spawning and rearing of larvae and juveniles of yellowfin tuna *Thunnus albacares*." The paper was coauthored by Mr. Vernon P. Scholey and Mss. Jeanne B. Wexler and Sharon L. Hunt.

Drs. Mark N. Maunder and Robert J. Olson participated in the PFRP [Pelagic Fisheries Research Program of the University of Hawaii at Manoa] Principal Investigators Workshop on November 14-15, 2005, at the University of Hawaii at Manoa. Four papers authored or coauthored by Drs. Maunder or Olson were presented at the workshop.

Drs. Richard B. Deriso, Michael G. Hinton, Mark N. Maunder, and Robert J. Olson participated in the PFRP Research Priorities Workshop on November 16-18, 2005, at the University of Hawaii at Manoa. Presentations were made by Drs. Deriso and Maunder.

Dr. Robin Allen participated in the 19th Regular Meeting of the International Commission for the Conservation of Atlantic Tunas in Seville, Spain, on November 14-20, 2005.

Dr. Michael G. Hinton participated in the Striped Marlin Stock Assessment Workshop of the International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific in Honolulu, Hawaii, on November 15-21, 2005.

Mr. Simon D. Hoyle participated in the 20th North Pacific Albacore Workshop in La Jolla, California, on November 28-December 2, 2005.

Mr. Vernon P. Scholey participated in the Segundo Foro Internacional de Acuicultura, held in Hermosillo, Sonora, Mexico, on December 1-3, 2005. Mr. Scholey was an invited speaker at the Marine Fishes section of the meeting, at which he presented a paper entitled "Investigación de la biología reproductora y el ciclo vital temprano del atún aleta amarilla, *Thunnus albacares*, en cautiverio," co-authored with Dr. Daniel Margulies and Mss. Jeanne B. Wexler and Sharon L. Hunt.

Dr. Michael G. Hinton participated in the first meeting of the technical working group of the Fishery Resources Monitoring System (FIRMS), which took place in Rome on December 5-8, 2005.

Mr. Brian S. Hallman participated in the second meeting of the Western and Central Pacific Fisheries Commission (WCPFC), which took place December 5-9, 2005, in Pohnpei, Federated States of Micronesia. The WCPFC adopted conservation and management measures for several tuna and bycatch species, to apply in the western Pacific Ocean. An Executive Director, Mr. Andrew Wright of Australia, and a Science Coordinator, Dr. Sung Kwon Soh of the Republic of Korea, have been appointed.

Mr. Kurt M. Schaefer spent the period of December 7-9, 2005, at the Hopkins Marine Station in Pacific Grove, California. On December 7-8 he participated in a workshop on "biological hotspots," sponsored by the Census of Marine Life (CML) program, and on December 9 he participated in a meeting of the Scientific Steering Committee of the Tagging of Pacific Pelagics program, also sponsored by the CML program. At the latter meeting he gave a presentation entitled "Movements, behavior, and habitat of yellowfin tuna in the eastern Pacific Ocean ascertained by archival tags," coauthored with Mr. Daniel W. Fuller and Dr. Barbara A. Block of Stanford University. Dr. Richard B. Deriso participated in the Scientific Steering Committee meeting on December 9-10, 2005.

DATA COLLECTION

The IATTC has field offices at Las Playas and Manta, Ecuador; Ensenada and Mazatlan, Mexico; Panama, Republic of Panama; Mayaguez, Puerto Rico, USA; and Cumaná, Venezuela.

Personnel at these offices collected 186 length-frequency samples and abstracted logbook information for 203 trips of commercial fishing vessels during the fourth quarter of 2005.

Also during the fourth quarter members of the field office staffs placed IATTC observers on 117 fishing trips by vessels that participate in the AIDCP On-Board Observer Program. In addition, 137 IATTC observers completed trips during the quarter, and were debriefed by field office personnel.

Surface fleet and surface catch and catch-per-unit-of-effort statistics

Statistical data are continuously being collected by personnel at the IATTC's field stations and processed at its headquarters in La Jolla. As a result, estimates of fisheries statistics with varying degrees of accuracy and precision are available, the most accurate and precise being those made after all available information has been entered into the data base, processed, and verified. The estimates for the current quarter are the most preliminary, while those made six months to a year after monitoring of the fishery are much more accurate and precise. While it may require a year or more to obtain some final information, much of the catch information is processed and available within two to three months of the return of a vessel from a fishing trip.

Fleet statistics

The estimated total carrying capacity of the vessels that fished in the eastern Pacific Ocean (east of 150°W; EPO) during 2005 is about 212,600 cubic meters (m^3) (Table 1). The weekly average at-sea capacity for the fleet, for the weekly periods ending October 9 through December 31, was about 136,600 m^3 (range: 98,800 to 176,400 m^3). The changes of flags and vessel names and additions to and deletions from the IATTC's fleet list during the fourth quarter of 2005 are given in Table 2. The EPO was closed to purse-seine fishing for tunas for two periods during 2005, which explains the low capacity-at-sea averages.

Catch and catch-per-unit-of-effort statistics

Catch statistics

The estimated total retained catches of tunas in the EPO during January 1-December 31, 2005, and the corresponding periods of 2000-2004, in metric tons, were:

Species	2005	2000-2004			Weekly average, 2005
		Average	Minimum	Maximum	
Yellowfin	273,500	351,200	272,700	413,900	5,300
Skipjack	267,000	190,700	141,300	248,900	5,100
Bigeye	49,500	50,300	34,400	75,500	>1,000

Summaries of the preliminary estimated retained catches, by flag of vessel, are shown in Table 3.

Catch-per-unit-of-effort statistics based on vessel logbook abstracts

The logbook data used in the analyses have been obtained with the cooperation of vessel owners and captains. The catch and effort measures used by the IATTC staff are based on fishing trips landing predominantly yellowfin, skipjack, bigeye, and bluefin tuna. The great majority of the purse-seine catches of yellowfin, skipjack, and bigeye are made by Class-6 vessels (vessels with well volumes greater than 425 m^3), and only data for Class-6 purse seiners are included herein for comparisons among years. There are now far fewer pole-and-line vessels than in previous years, so the data for these vessels are combined without regard to size classes. There are no adjustments included for other factors, such as type of set or vessel operating costs and market prices, which might identify whether a vessel was directing its effort toward a specific species.

Preliminary estimates of the catches per unit of effort (CPUEs), expressed as catches per day’s fishing by purse seiners, of yellowfin (Table 4), skipjack (Table 5), and bigeye (Table 6) in the EPO during the first three quarters of 2005 and the corresponding periods of 2000-2004, in metric tons, were:

Species	Region	2005	2000-2004		
			Average	Minimum	Maximum
Yellowfin	N of 5°N	10.5	16.3	10.6	21.7
	S of 5°N	4.6	5.7	4.3	7.5
Skipjack	N of 5°N	4.7	2.5	1.7	3.7
	S of 5°N	8.3	8.3	6.5	10.7
Bigeye	EPO	1.8	3.1	2.0	5.8

Preliminary estimates of the CPUEs, by pole-and-line vessels, of yellowfin (Table 4) and skipjack (Table 5) in the EPO during the first three quarters of 2005 and the corresponding periods of 2000-2004, in metric tons, were:

Species	Region	2005	2000-2004		
			Average	Minimum	Maximum
Yellowfin	EPO	4.2	2.1	0.7	3.2
Skipjack	EPO	1.0	1.2	0.2	2.5

Catch statistics for the longline fishery

Preliminary estimates of the catches of bigeye by longline gear in the EPO during 2005 are shown in Table 7. Equivalent data are not available for the other species of tunas, or for billfishes.

Size compositions of the surface catches of tunas

Length-frequency samples are the basic source of data used for estimating the size and age compositions of the various species of fish in the landings. This information is necessary to obtain age-structured estimates of the population for various purposes, including the integrated modeling that the staff has employed during the last several years. The results of such studies have been described in several IATTC Bulletins, in all of its Annual Reports since that for 1954, and in its Stock Assessment Reports.

Length-frequency samples of yellowfin, skipjack, bigeye, Pacific bluefin, and, occasionally, black skipjack from the catches of purse-seine, pole-and-line, and recreational vessels in the EPO are collected by IATTC personnel at ports of landing in Ecuador, Mexico, Panama, the USA, and Venezuela. The catches of yellowfin and skipjack were first sampled in 1954, bluefin in 1973, and bigeye in 1975. Sampling has continued to the present.

The methods for sampling the catches of tunas are described in the IATTC Annual Report for 2000 and in IATTC Stock Assessment Report 4. Briefly, the fish in a well of a purse-seine or pole-and-line vessel are selected for sampling only if all the fish in the well were caught during the same calendar month, in the same type of set (floating-object, unassociated school, or dolphin), and in the same sampling area. These data are then categorized by fishery (Figure 1).

Data for fish caught during the third quarter of each year of the 2000-2005 period are presented in this report. Two sets of length-frequency histograms are presented for each species; the first shows the data by strata (gear type, set type, and area) for the third quarter of 2005, and the second shows data for the combined strata for the third quarter of each year of the 2000-2005 period. Samples from 186 wells were taken during the third quarter of 2005.

There are ten surface fisheries for yellowfin defined for stock assessments: four associated with floating objects, two unassociated school, three associated with dolphins, and one pole-and-line (Figure 1). The last fishery includes all 13 sampling areas. Of the 186 wells sampled that contained fish caught during the third quarter of 2005, 138 contained yellowfin. The estimated size compositions of these fish are shown in Figure 2a. The majority of the yellowfin catch during the third quarter was taken by sets on unassociated schools and on schools associated with dolphins. There were small amounts of yellowfin taken in floating-object sets and by pole-and-line gear.

The estimated size compositions of the yellowfin caught by all fisheries combined during the third quarter of 2000-2005 are shown in Figure 2b. The average weights of the yellowfin caught during the third quarter of 2005 were less than those of any year of the 2000-2004 period.

There are eight fisheries for skipjack defined for stock assessments: four associated with floating objects, two unassociated school, one associated with dolphins, and one pole-and-line (Figure 1). The last two fisheries include all 13 sampling areas. Of the 186 wells sampled that contained fish caught during the third quarter of 2005, 158 contained skipjack. The estimated size compositions of these fish are shown in Figure 3a. A large amount of skipjack was caught in the Northern unassociated fishery. Also, significant amounts of skipjack were taken in the floating-object fisheries in the Northern, Equatorial, Inshore, and Southern regions. Small amounts of skipjack were taken in schools associated with dolphins and by pole-and-line gear.

The estimated size compositions of the skipjack caught by all fisheries combined during the third quarter of 2000-2005 are shown in Figure 3b. The average weights of the skipjack caught during the third quarter of 2005 were less than those of any year of the 2000-2004 period.

There are seven surface fisheries for bigeye defined for stock assessments: four associated with floating objects, one unassociated school, one associated with dolphins, and one pole-and-line (Figure 1). The last three fisheries include all 13 sampling areas. Of the 186 wells sampled that contained fish caught during the third quarter of 2005, 57 contained bigeye. The estimated size compositions of these fish are shown in Figure 4a. The majority of the catch was taken in floating-object sets in all but the Inshore area, where only a small amount was taken. A small amount of bigeye was caught in the unassociated fishery.

The estimated size compositions of the bigeye caught by all fisheries combined during the third quarter of 2000-2005 are shown in Figure 4b. The average weight of bigeye during the third quarter of 2005 was slightly less than that of the previous year, and considerably less than those of 2000-2003.

The estimated retained catch of bigeye less than 60 cm in length during the first three quarters of 2005 was 5,642 metric tons (t), or about 28 percent of the estimated total catch of bigeye by purse seiners during those three quarters. The corresponding amounts for the first three quarters of 2000-2004 ranged from 2,712 to 11,768 t. or 4 to 37 percent.

Pacific bluefin are caught by purse-seine and recreational gear off California and Baja

California from about 23°N to 35°N, with most of the catch being taken during May through October. During 2005 bluefin were caught between 25°N and 33°N, mostly from May through early August, but with a few small catches in late August. Only two samples of bluefin caught in 2005 were obtained, one from a commercial vessel and one from a recreational vessel, so no size composition data for 2005 are presented in this report. (Nearly all of the commercially-caught fish were transferred to pens for fattening and eventual sale as sashimi-grade fish, and it is not possible to measure these fish.) The commercial catch (4,545 t) of bluefin far exceeded the recreational catch (95 t), but the estimate for the latter is very preliminary.

Observer program

Coverage

The Agreement on the International Dolphin Conservation Program (AIDCP) requires 100-percent coverage by observers on trips by purse seiners with carrying capacities greater than 363 metric tons that fish for tunas in the eastern Pacific Ocean (EPO). This mandate is carried out by the AIDCP On-Board Observer Program, made up of the IATTC's international observer program and the observer programs of Colombia, Ecuador, the European Union, Mexico, and Venezuela. The observers are biologists trained to collect a variety of data on the mortalities of dolphins associated with the fishery, sightings of dolphin herds, catches of tunas and bycatches of fish and other animals, oceanographic and meteorological data, and other information used by the IATTC staff to assess the conditions of the various stocks of dolphins, study the causes of dolphin mortality, and assess the effect of the fishery on tunas and other components of the ecosystem. The observers also collect data relevant to compliance with the provisions of the AIDCP, and data required for the tuna-tracking system established under the AIDCP, which tracks the "dolphin-safe" status of tuna caught in each set from the time it is captured until it is unloaded (and, after that, until it is canned and labeled).

In 2005 the observer programs of Colombia, Mexico, and Venezuela are to sample half, and that of Ecuador approximately one-third, of the trips by vessels of their respective fleets, while IATTC observers are to sample the remainder of those trips. The national program of the European Union has sampled one trip of a Spanish-flag vessel in 2005, but has advised the IATTC that it will be inactive until further notice. In the meantime the IATTC program will sample Spanish vessels. Except as described in the next paragraph, the IATTC is to cover all trips by vessels registered in other nations that are required to carry observers.

At the fifth meeting of the Parties to the AIDCP in June 2001, observers from the international observer program of the South Pacific Forum Fisheries Agency (FFA) were approved to collect pertinent information for the On-Board Observer Program, pursuant to Annex II (9) of the AIDCP in cases for which the Director determines that the use of an observer from the AIDCP On-Board Observer Program is not practical.

Observers from the On-Board Observer Program departed on 170 fishing trips aboard purse seiners covered by that program during the fourth quarter of 2005. Preliminary coverage data for these vessels during the quarter are shown in Table 8. In addition to those trips, the On-Board Observer Program is also placing observers aboard a vessel that is less than 363 metric tons capacity during 2005, as required by AIDCP Resolution A-02-01. One fishing trip by that vessel was sampled during the quarter.

Training

There was one IATTC observer training course during the quarter, held in Manta, Ecuador, on November 14-25, 2005, for 19 trainees. Six of those trainees were from the Ecuadorian national observer program.

RESEARCH

Yellowfin tuna tagging project

The IATTC staff conducted yellowfin tuna-tagging cruises aboard the long-range sport-fishing vessels *Royal Star* in October 2002, October 2003, November 2004, and October 2005 and *Shogun* in August 2004 and August 2005 in collaboration with the Tagging of Pacific Pelagics (TOPP) program, which is being conducted within the framework of the Census of Marine Life (COML). TOPP is a program that uses electronic tagging technology to study the movements of large open-ocean animals, and the oceanographic factors influencing their behavior.

During the October 12-22, 2005, tagging cruise conducted offshore off Baja California, Mexico, 75 archival tags (Lotek LTD 2310) were implanted into the peritoneal cavities of yellowfin, ranging from 60 to 100 cm in length, captured by rod and reel. Of these, 22 were deployed in fish at Alijos Rocks (24°56'N-115°45'W), and 53 in fish near the 23-fathom spot (25°15'N-112°48'W), northwest of Magdalena Bay.

A total of 305 yellowfin were tagged with archival tags in collaboration with TOPP during 2002, 2003, 2004, and 2005, and there have been 95 recaptures as of December 31, 2005:

Year	Released	Returned	Percent returned
2002	25	13	52.0
2003	43	23	53.5
2004	115	44	38.3
2005	122	15	12.3
Total	305	95	31.2

There have been 36 returns from the releases in 2002 and 2003. The times at liberty ranged from 9 to 1,161 days, with 20 fish having been at liberty for more than 150 days.

The SST-corrected geolocation estimates, based on sea-surface temperatures (SSTs) from the archival tags and matching SSTs from remotely-sensed data, for the fish at liberty for more than 10 months, show seasonal movements to the south and then to the north correlated with shifts in the SSTs off Baja California. A histogram of the daily SSTs recorded in the day log of the archival tags indicates that nearly 99 percent of the SSTs were 19°C or greater, which probably indicates that the southerly and northerly seasonal movements of the fish off Baja California are influenced by changing oceanographic conditions.

The diving behavior of each fish each day at liberty was classified as Type-1 (fewer than 10 dives to depths greater than 150 m) or Type-2 (10 or more dives to depths greater than 150 m). Diving behavior may be associated with foraging on prey organisms of the deep scattering layer. The fish displayed Type-1 and Type-2 behavior on about 80 and 20 percent of the days that they were at liberty, respectively. In addition, surface orientation, defined as remaining within 10 m of the surface for 10 or more consecutive minutes, was recorded for each fish. Surface orientation occurred about 13 times per day. Data on surface orientation are potentially useful for evaluation of alternative methodologies, such as optical techniques, for abundance estimation, estimation of the relative vulnerability of fish to fishing gear, and collection of oceanographic data with archival tags implanted in tunas, billfishes, sharks, *etc*.

A female yellowfin tuna with an LTD 2310 archival tag was recaptured after 1,161 days at liberty by a recreational angler fishing aboard the long-range sport-fishing vessel *Royal Polaris*. The fish was 90 cm long when it was released on October 12, 2002, and 162 cm long when it was recaptured on December 17, 2005, indicating an average growth rate of 1.9 cm per month. Position estimates recorded by the archival tag for the entire period that the fish was at liberty indicated that its greatest distance from the point of release was about 600 nautical miles (nm). The recapture position, about 50 nm southwest of Magdalena Bay, was only about 150 nm south-southeast of the release location. This was the 13th fish recaptured from 25 released with archival tags in October 2002, and represents the greatest time at liberty to date for a yellowfin with an archival tag attached to it by IATTC staff members.

Early life history studies

Yellowfin broodstock

The yellowfin broodstock in Tank 1 (1,362,000 L) at the Achotines Laboratory resumed spawning on October 9, following a 41-day hiatus, and continued spawning throughout the rest of the quarter, except on November 26 and December 6. Spawning occurred between 8:10 p.m. and 10:00 p.m. The numbers of eggs collected after each spawning event ranged from about 3,000 to 1,106,000. The water temperatures in the tank ranged from 27.5° to 28.7°C during the quarter.

Two 18- kg females and one 62- kg male died during the quarter. One died from striking the wall of the tank, one became entangled in the egg collection net, and one died of starvation. At the end of December there were three size groups of fish in Tank 1: 1 large fish (118 kg), 7 55- to 73-kg fish, and 17 18- to 37-kg fish.

From January 2003 through December 2004 archival tags had been implanted in yellowfin tuna (IATTC Quarterly Reports for January-March 2003, April-June 2004, and October-December 2004), and at the end of December seven fish from those groups remained in Tank 1.

At the end of the quarter there was one yellowfin tuna in Tank 2.

Rearing of yellowfin eggs, larvae, and juveniles

During the quarter the following parameters were recorded for most spawning events: times of spawning, egg diameter, duration of egg stage, hatching rate, lengths of hatched larvae, and duration of yolk-sac stage. The weights of the eggs, yolk-sac larvae, and first-feeding larvae, and the lengths and selected morphometrics of these, were measured periodically.

Studies of snappers

The work on spotted rose snappers (*Lutjanus guttatus*) is carried out by the Dirección General de Recursos Marinos y Costeros (DGRMC) de Panamá.

Two separate broodstocks of snappers are being kept in two 85,000-L tanks. The first consists of 15 individuals from the original broodstock caught in 1996. They continued to spawn during the fourth quarter with moderate frequency and intensity (number of eggs).

The second group consists of 25 individuals from a group bred at the Laboratory from eggs obtained from spawning in 1998. These fish spawned about once a week during the fourth quarter.

At the end of the quarter size-sorted juvenile snappers resulting from eggs hatched on October 4 and 5, 2005, were being reared in three tanks. In early January the juvenile snappers will be used in cage-culture trials at a shrimp farm as part of a DGRMC culture program.

Visitors at the Achotines Laboratory

Ms. Araceli Avilés Quevedo, Coordinator of the Marine Fish Culture Project at the Instituto Nacional de la Pesca in La Paz, Baja California, Mexico, spent the period of October 4-13, 2005, at the Achotines Laboratory. During her stay Ms. Avilés worked primarily with Mr. Amado Cano on snapper culture, but also spent time with the Achotines staff learning about the seawater system, infrastructure, and general techniques of tuna culture.

Oceanography and meteorology

Easterly surface winds blow almost constantly over northern South America, which causes upwelling of cool, nutrient-rich subsurface water along the equator east of 160ºW, in the coastal regions off South America, and in offshore areas off Mexico and Central America. El Niño events are characterized by weaker-than-normal easterly surface winds, which cause above-normal sea-surface temperatures (SSTs) and sea levels and deeper-than-normal thermoclines over much of the tropical eastern Pacific Ocean (EPO). In addition, the Southern Oscillation Indices (SOIs) are negative during El Niño episodes. (The SOI is the difference between the anomalies of sea-level atmospheric pressure at Tahiti, French Polynesia, and Darwin, Australia. It is a measure of the strength of the easterly surface winds, especially in the tropical Pacific in the Southern Hemisphere.) Anti-El Niño events, which are the opposite of El Niño events, are characterized by stronger-than-normal easterly surface winds, below-normal SSTs and sea levels, shallower-than-normal thermoclines, and positive SOIs. Two additional indices, the NOI* (Progress Ocean., 53 (2-4): 115-139) and the SOI*, have recently been devised. The NOI* is the difference between the anomalies of sea-level atmospheric pressure at the North Pacific High (35°N-130°W) and Darwin, Australia, and the SOI* is the difference between the anomalies of sea-level atmospheric pressure at the South Pacific High (30°S-95°W) and Darwin. Ordinarily, the NOI* and SOI* values are both negative during El Niño events and positive during anti-El Niño events.

During the first three quarters of 2005 the SSTs were nearly normal, although there were small areas of cool water, mostly near the coast, and small areas of warm water, mostly offshore, during every month. During October there was an area of cool water off Peru, which extended to the northwest, reaching the area west of the Galapagos Islands. During November it extended further to the west, reaching about 120°W. During December it extended further west along the Equator to about 125°W, but it had largely dissipated off the coast of Peru. In addition, areas of warm water appeared in scattered offshore locations, mostly south of 10°S during all three months (Figure 5). The data in Table 9 are mixed. In the equatorial area the SSTs were below normal from July to December between 80°W and 90°W, but above normal west of there during July and August. During the first half of the year the SST anomalies tended to go from above normal to below normal, except west of 150°W. No patterns are evident in the data for the SOIs, SOI*s, and NOI*s. According to the Climate Diagnostics Bulletin of the U.S. National Weather Service for December 2005, "Weak [anti-El Niño] conditions are expected to continue during the next 3-6 months."

GEAR PROGRAM

During the fourth quarter the IATTC staff participated in one dolphin safety-gear inspection aboard a Venezuelan-flag purse seiner.

COLLECTION OF AT-SEA AND SUPPLEMENTAL RETAINED CATCH DATA FOR SMALL PURSE SEINERS

The U.S. National Oceanic and Atmospheric Administration has awarded the IATTC a contract to place observers, on a voluntary basis, on sufficient numbers of trips of Class-5 purse seiners based in ports on the Pacific Coast of Latin America to obtain data on "catch, bycatch, interaction with protected species, and gear" for 1,000 days at sea per year and to "sample 100 percent of the in-port unloadings of Class 4-5 purse seine vessels." If that is not possible, observers can be placed on sufficient numbers of trips of Class-3 and/or -4 vessels to bring the total numbers of days at sea observed to 1,000. Mr. Erick Largacha, who had been in charge of the IATTC's Manta field office, was transferred to La Jolla at the end of the year to take charge of this work.

INTER-AGENCY COOPERATION

Dr. Mark N. Maunder visited Dr. P. Takis Besbeas, at the University of Kent (England) on October 23-25, 2005, where they continued their work on approximate likelihoods. In addition, he gave the presentation "Incites into Bayesian analysis" (misspelling intentional) and conducted an AD Model Builder course. His expenses were partially covered by the National Center for Statistical Ecology (sponsored by three universities in the United Kingdom).

PUBLICATIONS

IATTC Bulletin

Schaefer, Kurt M., Daniel W. Fuller, and Naozumi Miyabe. 2005. Reproductive biology of bigeye tuna (*Thunnus obesus*) in the eastern and central Pacific Ocean. Inter-Amer. Trop. Tuna Comm. Bull., 23 (1): 1-31.

Outside journals

Bayliff, William H., Juan Ignacio de Leiva Moreno, and Jacek Majkowski (editors). 2005. Management of tuna fishing capacity: conservation and socio-economics. FAO Fish. Proc., 2: xvi, 336 pp.

Kawakita, M., M. Minami, S. Eguchi, and C. E. Lennert-Cody. 2005. An introduction to the predictive technique AdaBoost with a comparison to generalized additive models. Fish. Res., 76 (3): 328-343.

ADMINISTRATION

A special program for collection of data for small purse seiners is described elsewhere in this report. Mr. Erick D. Largarcha Delgado, who had been in charge of the IATTC's Manta field office, was transferred to La Jolla at the end of the year to take charge of this work.

Mr. Carlos de la A. Florencia will replace Mr. Largacha as the person in charge of the Manta field office on January 1, 2006. Messrs. Harold Valverde and Alex Urdiales, both graduates of the University of Guayaquil, were added to the staff of that field office on November 1, 2005. Mr. Valverde will be in charge of the operations of the IATTC-NOAA program in Manta and help with other aspects of the work in Manta, and Mr. Urdiales will participate in all aspects of the work in Manta. Both of these men are well qualified for their work, having made 28 and 53 trips, respectively, as observers aboard tuna vessels.

Ms. Sharon L. Hunt, a member of the early life history group since February 2000, resigned on October 31, 2005, so that she can devote more time to the care of her young son. Ms. Hunt was a valuable member of that group, having co-authored five papers with other members of the group. She will be missed, but everyone wishes her and her family the best.

Ms. Jenny M. Suter resigned on November 22, 2005, to devote her time to caring for her infant daughter and finishing her master's thesis at San Diego State University. Ms. Suter was first employed as a technician for the early life history group in June 1994. In December 1999 she was promoted to associate scientist and placed in charge of the length-frequency program. Ms. Suter was a good worker; she was the coauthor of four papers on the early life history of tunas as a result of the first phase of her employment, and during the second phase she did a good job at maintenance of the length-frequency data base and analysis of the data. She will be missed, but everyone wishes her the best in the future.

Ms. Maria Santiago, a graduate of the University of North Dakota at Grand Forks, was hired on December 27, 2005, to replace Ms. Sharon L. Hunt, who had resigned on October 31, 2005. Ms. Santiago had previously worked for Dr. Robert J. Olson from June 10 to August 3, 2005. Everyone is glad to have her back.

VISITING SCIENTIST

Mr**.** Takayuki Matsumoto, an employee of the National Research Institute of Far Seas Fisheries of Japan, arrived in La Jolla on November 29, 2005, for a one-year stay, during which time he will be working principally with Dr. William H. Bayliff on the Japanese longline fishery for tunas and billfishes in the eastern Pacific Ocean.

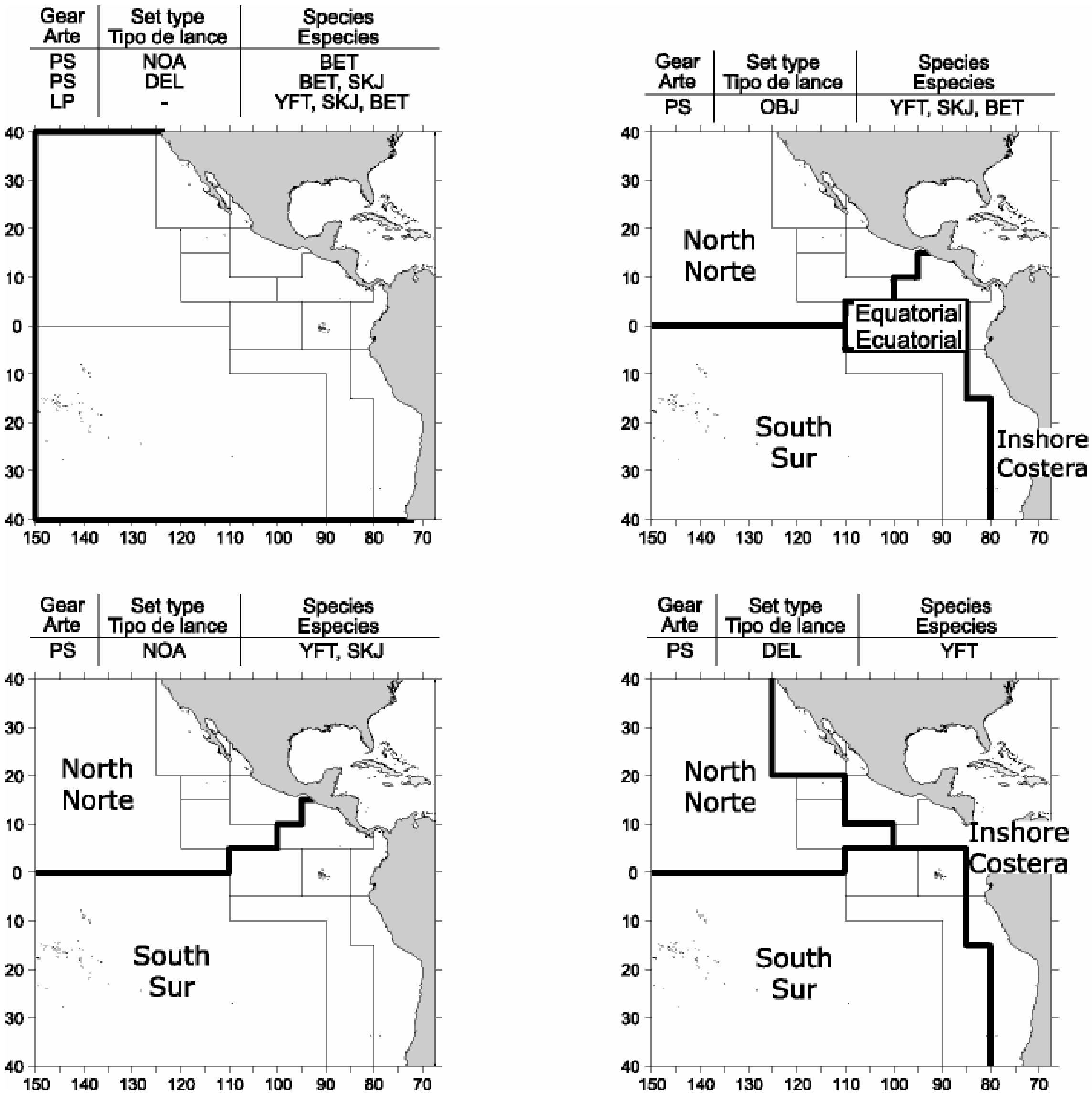

FIGURE 1. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries. Gear: PS = purse seine, LP = pole and line; Set type: NOA = unassociated, DEL = dolphin, OBJ = floating object; Species: YFT = yellowfin, SKJ = skipjack, BET = bigeye.

FIGURA 1. Extensión espacial de las pesquerías definidas por el personal de la CIAT para la evaluación de las poblaciones de atún aleta amarilla, barrilete, patudo, y aleta azul en el OPO. Las líneas delgadas indican los límites de las 13 zonas de muestreo de frecuencia de tallas, y las líneas gruesas los límites de las pesquerías. Artes: PS = red de cerco, LP = caña; Tipo de lance: NOA = no asociado, DEL = delfín; OBJ = objeto flotante; Especies: YFT = aleta amarilla, SKJ = barrilete, BET = patudo.

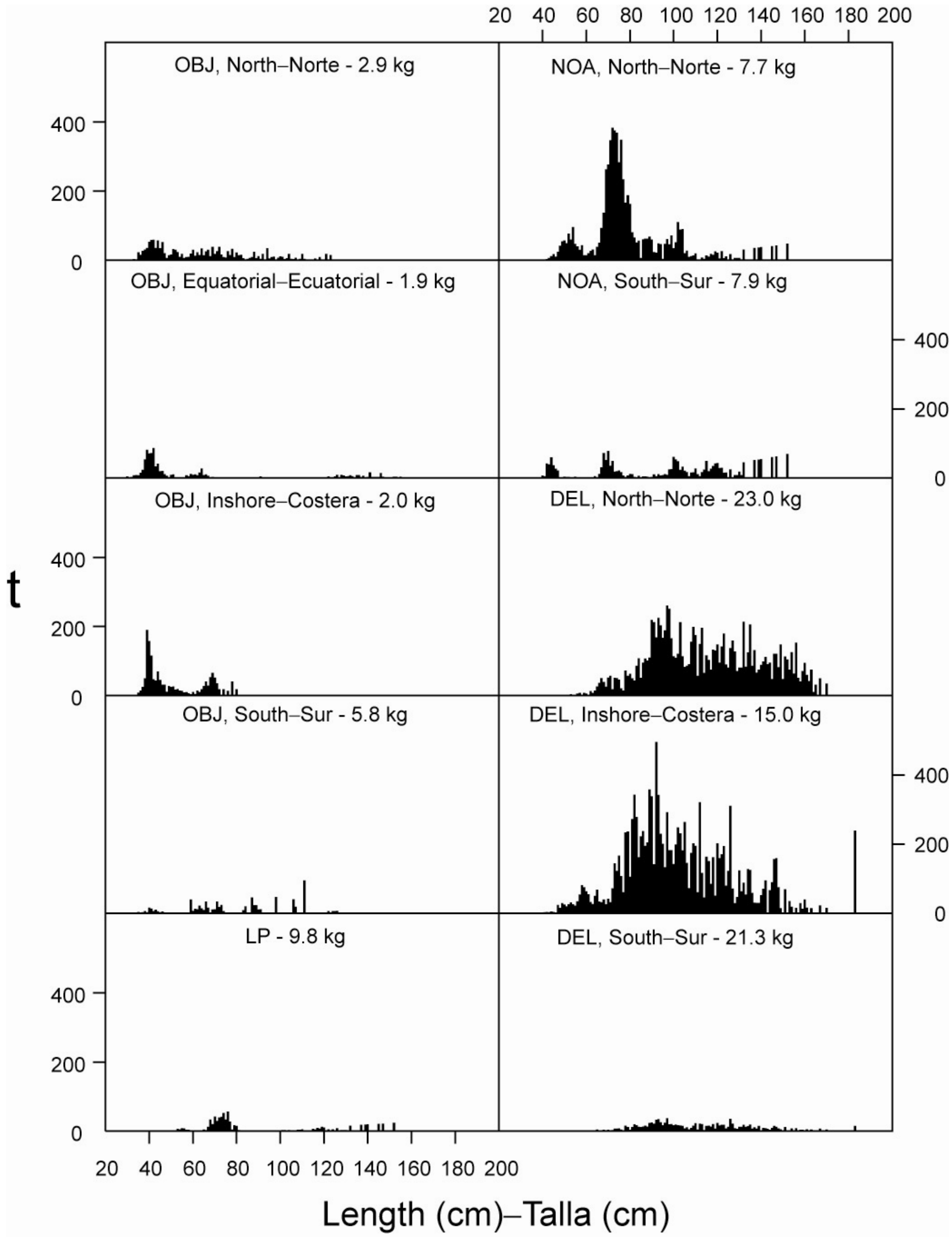

FIGURE 2a. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the third quarter of 2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 2a. Composición por tallas estimada del aleta amarilla capturado en cada pesquería del OPO durante el tercero trimestre de 2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caña; NOA = no asociado; DEL = delfín.

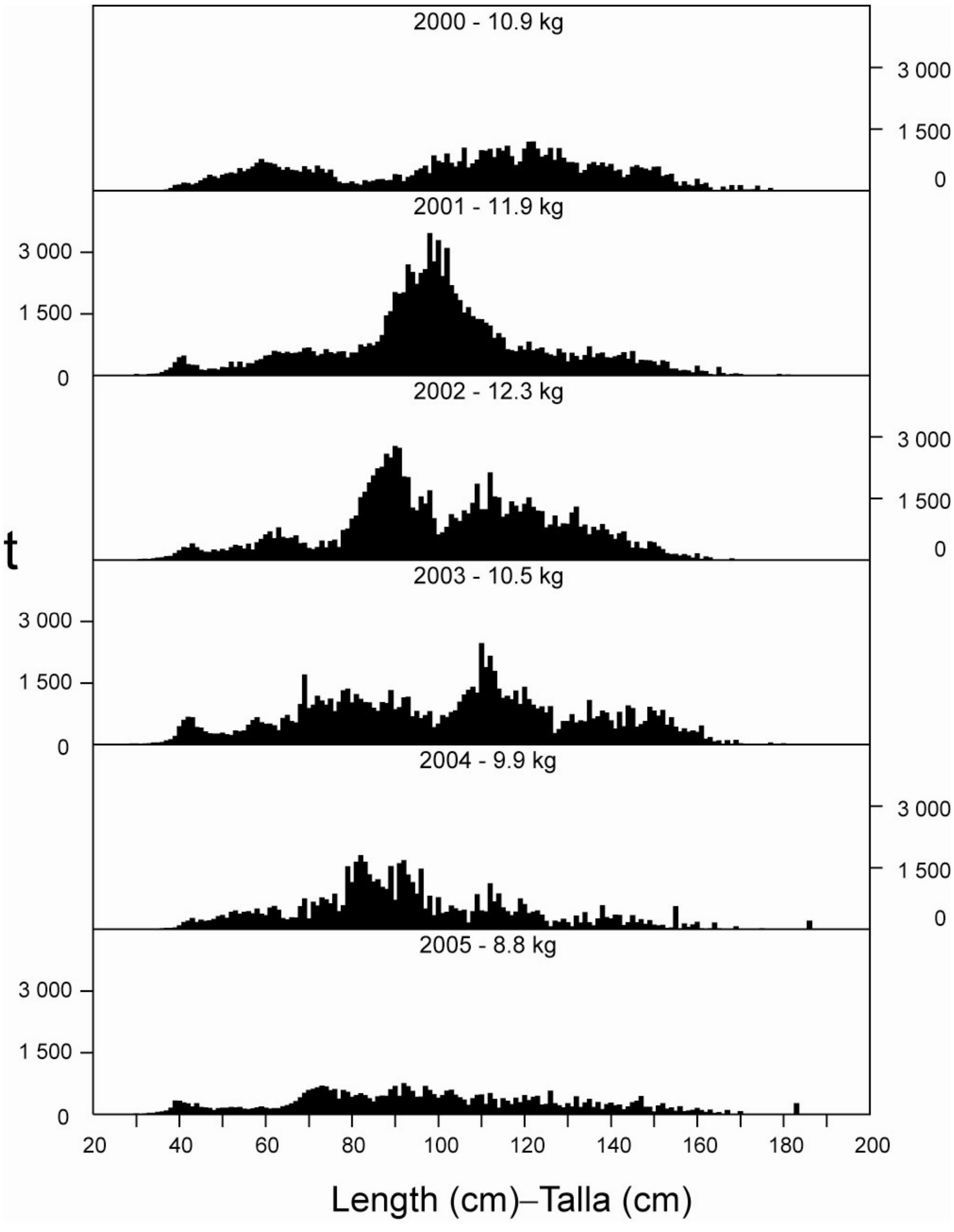

FIGURE 2b. Estimated size compositions of the yellowfin caught in the EPO during the third quarter of 2000-2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 2b. Composición por tallas estimada del aleta amarilla capturado en el OPO en el tercero trimestre durante 2000-2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

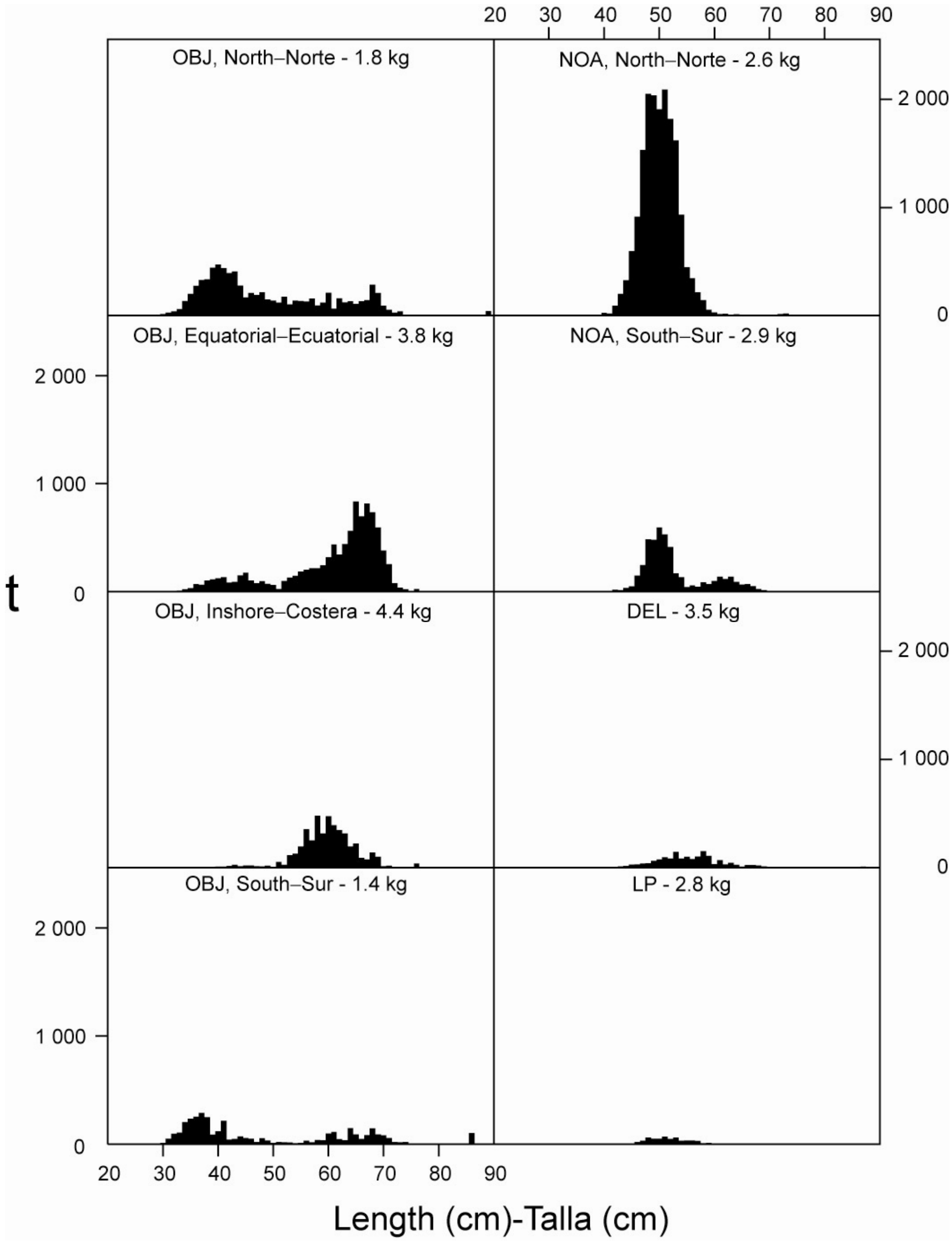

FIGURE 3a. Estimated size compositions of the skipjack caught in each fishery of the EPO during the third quarter of 2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.
FIGURA 3a. Composición por tallas estimada del barrilete capturado en cada pesquería del OPO durante el tercero trimestre de 2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caña; NOA = no asociado; DEL = delfín.

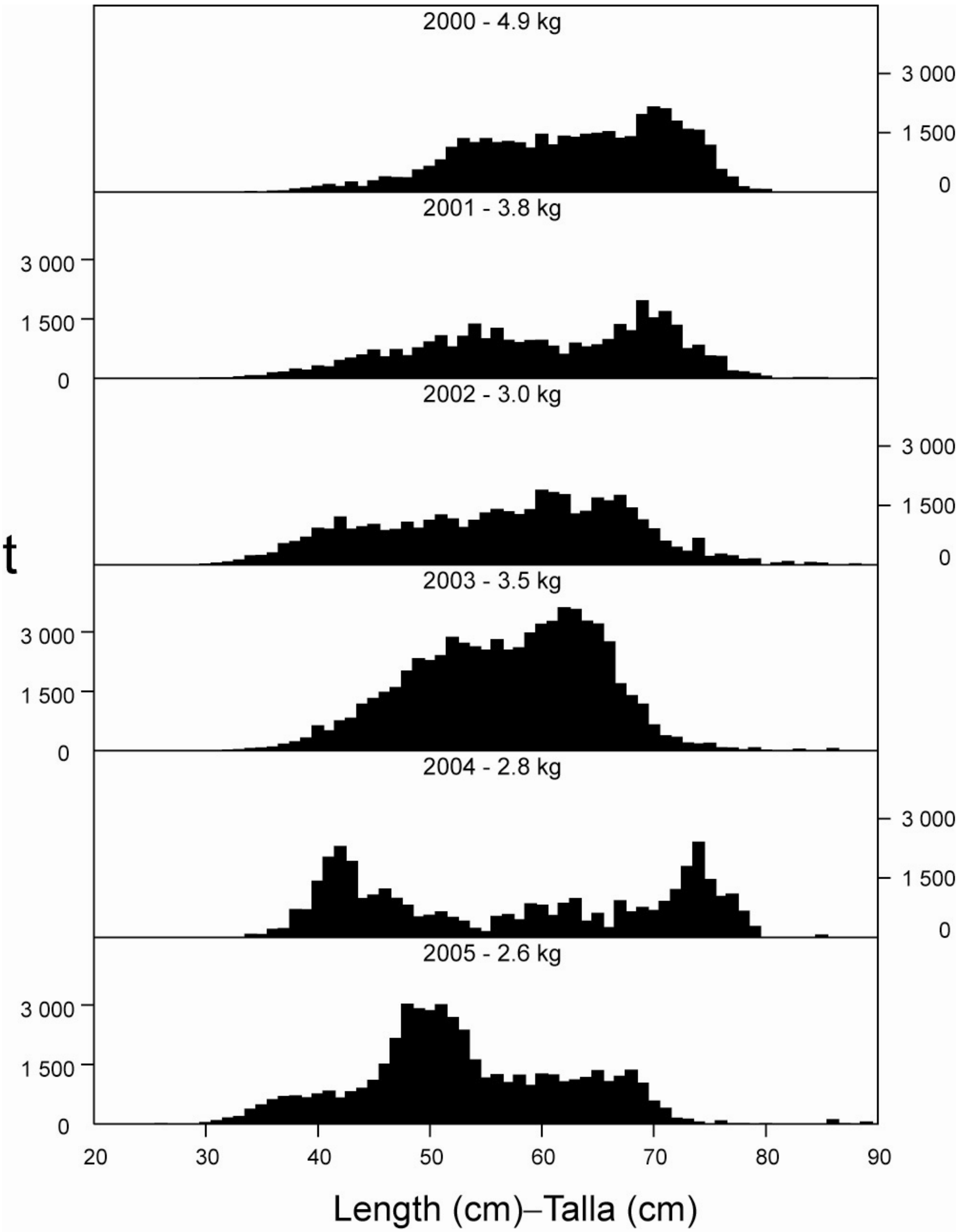

FIGURE 3b. Estimated size compositions of the skipjack caught in the EPO during the third quarter of 2000-2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.
FIGURA 3b. Composición por tallas estimada del barrilete capturado en el OPO en el tercero trimestre durante 2000-2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

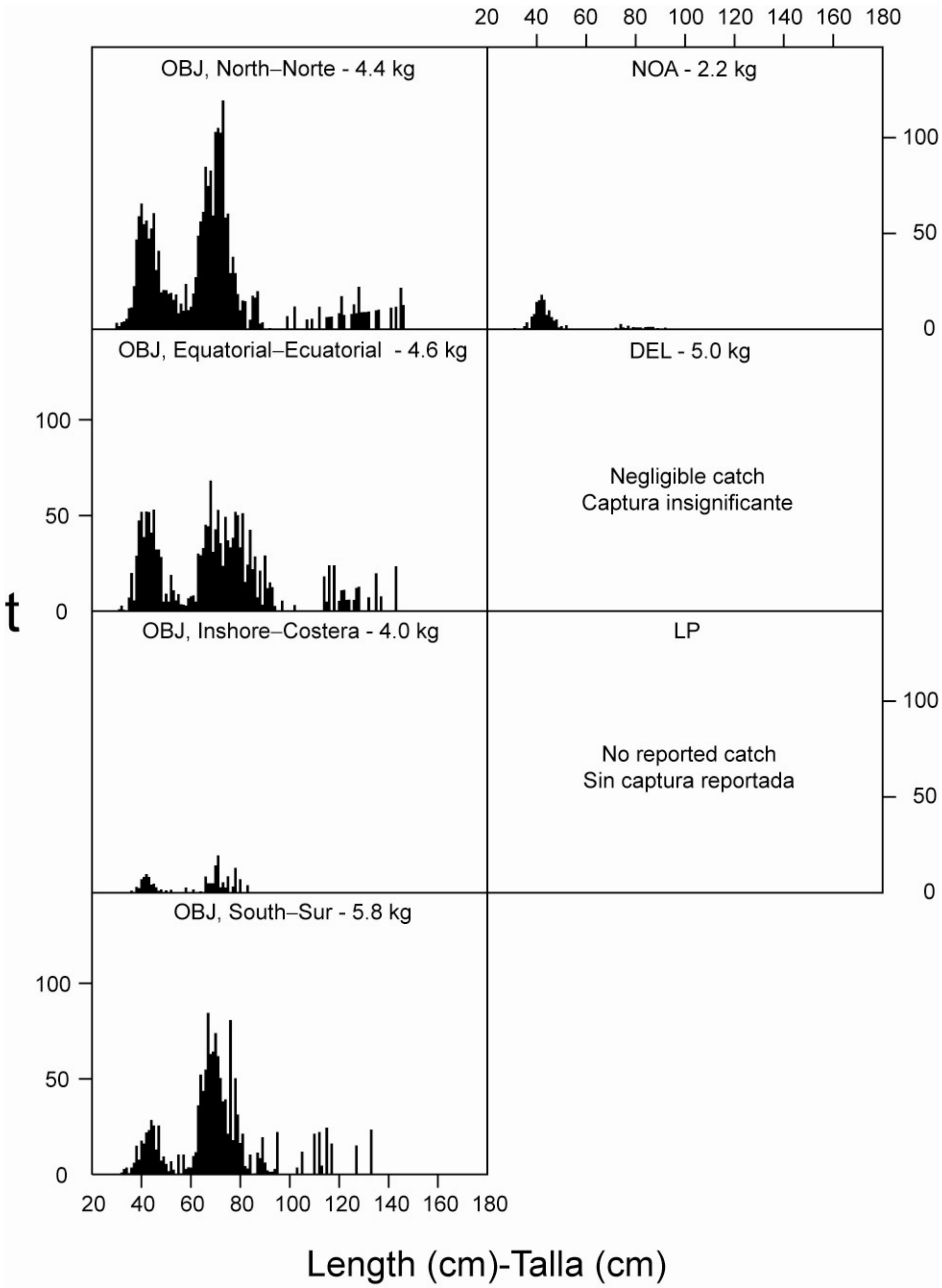

FIGURE 4a. Estimated size compositions of the bigeye caught in each fishery of the EPO during the third quarter of 2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 4a. Composición por tallas estimada del patudo capturado en cada pesquería del OPO durante el tercero trimestre de 2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caña; NOA = no asociado; DEL = delfín.

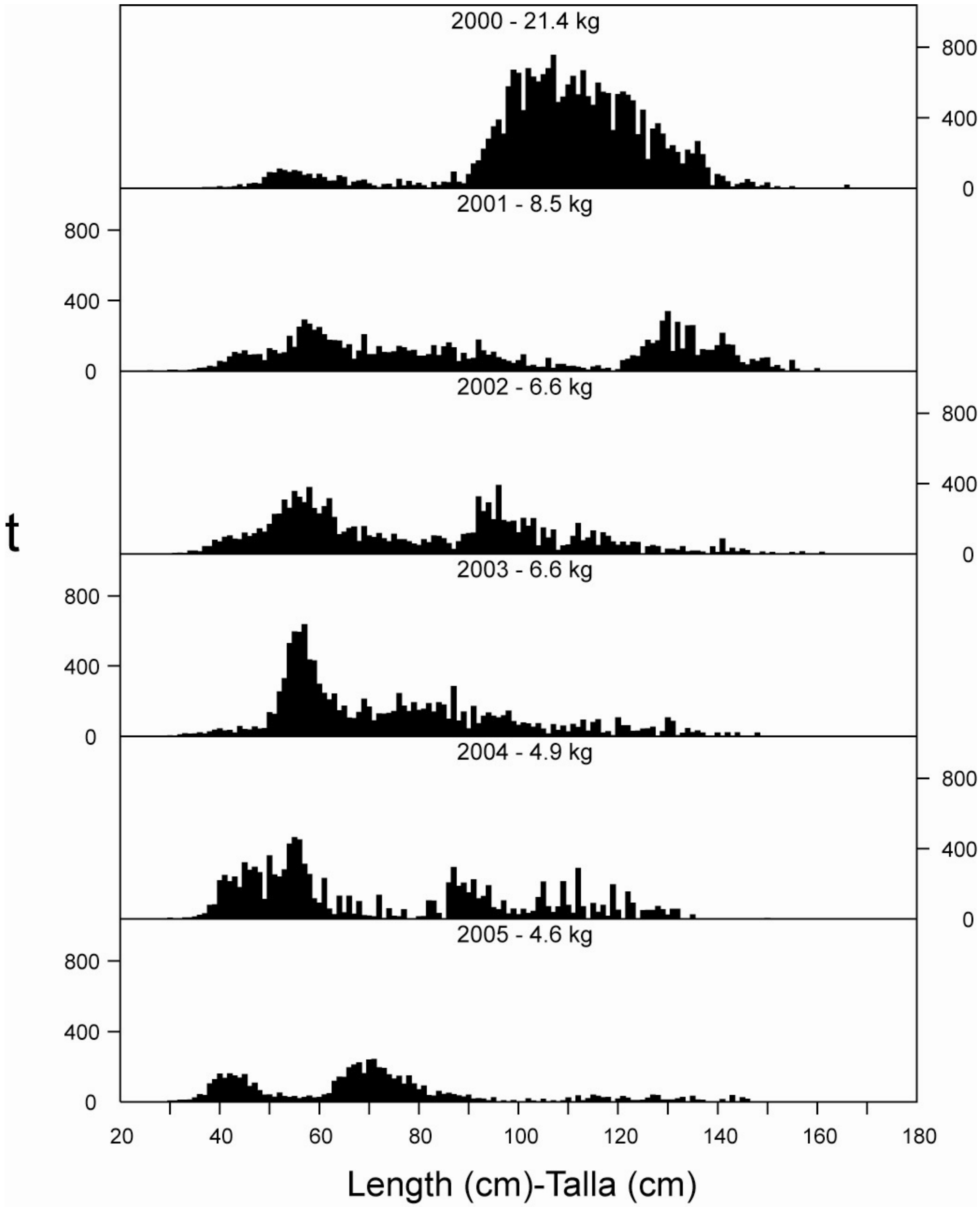

FIGURE 4b. Estimated size compositions of the bigeye caught in the EPO during the third quarter of 2000-2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 4b. Composición por tallas estimada del patudo capturado en el OPO en el tercero trimestre durante 2000-2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

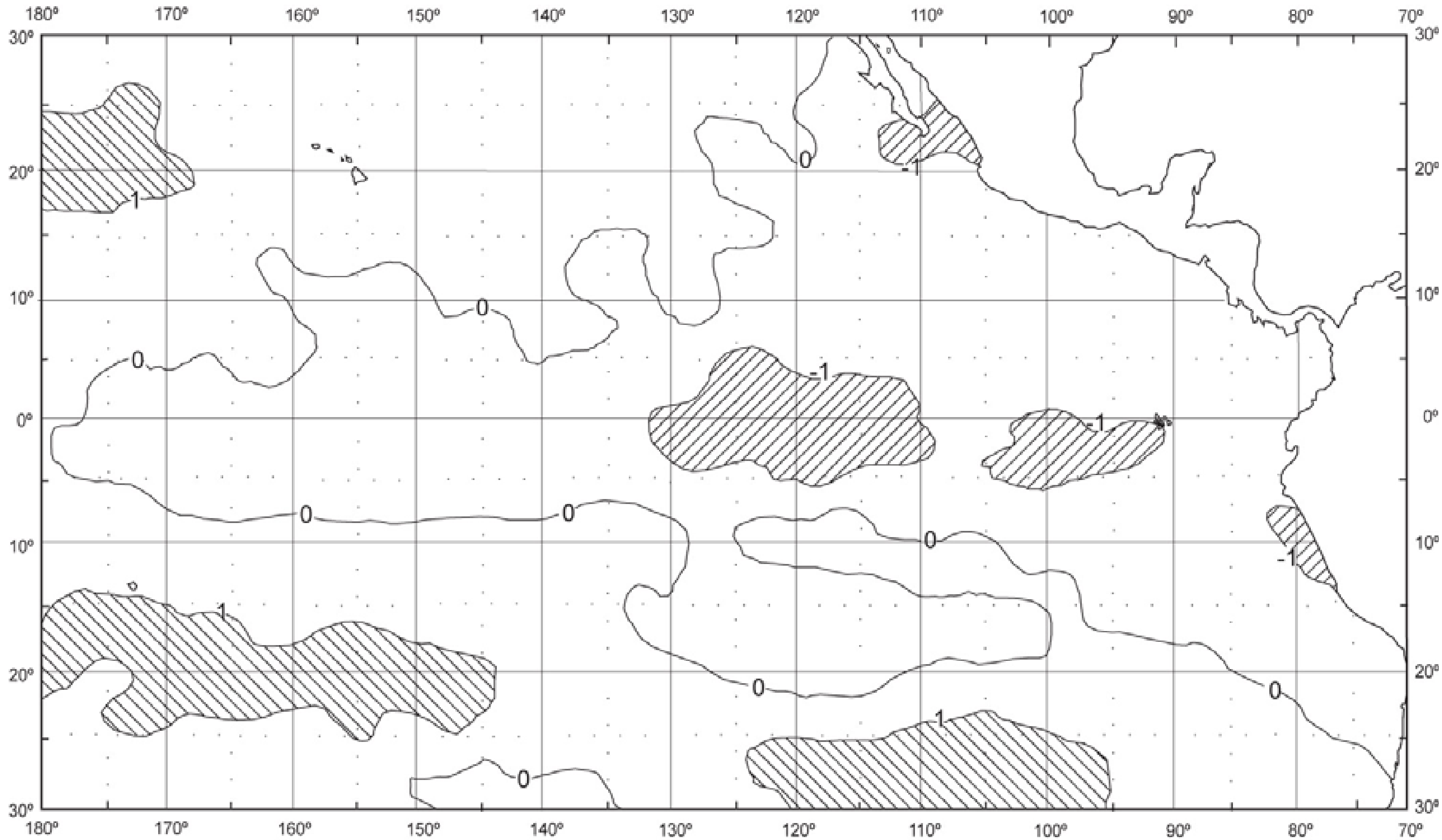

FIGURE 5. Sea-surface temperature (SST) anomalies (departures from long-term normals) for December 2005, based on data from fishing boats and other types of commercial vessels.

FIGURA 5. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en diciembre de 2005, basadas en datos tomados por barcos pesqueros y otros buques comerciales.

TABLE 1. Preliminary estimates of the numbers and carrying capacities, in cubic meters, of purse seiners and pole-and-line vessels operating in the EPO in 2005 by flag, gear, and size class. Each vessel is included in the totals for each flag under which it fished during the year, but is included only once in the fleet total. Therefore the totals for the fleet may not equal the sums of the individual flag entries. PS = purse seine; LP = pole-and-line. The size classes, in cubic meters of carrying capacity, are as follows: 1, <53; 2, 53-106; 3, 107-212; 4, 213-319; 5, 320-425; 6, >425.

TABLA 1. Estimaciones preliminares del número de buques cerqueros y de cañero que pescan en el OPO en 2005, y de la capacidad de acarreo de los mismos, en metros cúbicos, por bandera, arte de pesca, y clase de arqueo. Se incluye cada buque en los totales de cada bandera bajo la cual pescó durante el año, pero solamente una vez en el total de la flota; por consiguiente, los totales de las flotas no son siempre iguales a las sumas de las banderas individuales. PS = cerquero; LP = cañero. Las clases de arquero, en metros cúbicos de capacidad de acarreo, son las siguentes: 1, <53; 2, 53-106; 3, 107-212; 4, 213-319; 5, 320-425; 6, >425.

Flag	Gear	Size class—Clase de arqueo							Capacity
Bandera	Arte	1	2	3	4	5	6	Total	Capacidad
					Number—Número				
Colombia	PS	-	-	-	1	1	11	13	14,439
Ecuador	PS	-	4	9	13	10	42	78	54,649
España—Spain	PS	-	-	-	-	-	3	3	6,955
Guatemala	PS	-	-	-	-	-	1	1	1,475
Honduras	PS	-	-	-	-	-	3	3	2,810
México	PS	-	-	2	5	11	41	59	56,163
	LP	-	1	3	-	-	-	4	498
Nicaragua	PS	-	-	-	-	-	6	6	8,060
Panamá	PS	-	-	-	1	1	23	25	33,849
El Salvador	PS	-	-	-	-	-	4	4	6,324
USA—EE.UU.	PS	-	-	1	-	-	1	2	1,365
Venezuela	PS	-	-	-	-	-	26	26	33,839
Vanuatu	PS	-	-	-	-	-	2	2	2,163
Unknown—Desconocidia	PS	-	-	-	-	-	1	1	1,195
All flags—	PS	-	4	12	20	23	156	215	
Todas banderas	LP	-	1	3	-	-	-	4	
	PS + LP	-	5	15	20	23	156	219	
					Capacity—Capacidad				
All flags—	PS	-	407	2,272	5,879	10,440	193,104	212,102	
Todas banderas	PL	-	101	397	-	-	-	498	
	PS + LP	-	508	2,669	5,879	10,440	193,104	212,600	

TABLE 2. Changes in the IATTC fleet list recorded during the fourth quarter of 2005. PS = purse seine; LP = pole-and-line.
TABLA 2. Cambios en la flota observada por la CIAT registrados durante el cuarto trimestre de 2005. PS = cerquero; LP = cañero.

Vessel name	Flag	Gear	Capacity (m^3)	Remarks	
Nombre del buque	**Bandera**	**Arte**	**Capacidad (m^3)**	**Comentarios**	
Vessels added to the fleet—Buques añadidos a la flota					
New entry—1[er] ingreso					
				Now—Ahora	
Montelape	El Salvador	PS	796		
Re-entries—Reingresos					
				Now—Ahora	
San Marino I	Panamá	PS	796	*Don Camilo*	
Changes of name or flag—Cambios de nombre o pabellon					
				Now—Ahora	
Atlantis	USA	PS	1,195		Unknown—Desconocido
Jane	Venezuela	PS	1,250	*Jane IV*	Panamá
La Foca	Venezuela	PS	1,287	*Baraka*	Panamá
Maria Del Mar A	Venezuela	PS	1,784		Panamá
Napoleon	Venezuela	PS	1,191	*Napoleon I*	Panamá
Templario	Venezuela	PS	1,268	*Templario*	Panamá
Vessels removed from the fleet—Buques retirados de la flota					
Emperador	Ecuador	PS	82		
Sant Yago Uno	Guatemala	PS	1,940		
Excalibur	México	PS	160		
San Gabriel	México	PS	294		
San Miguel	México	PS	294		
Tizoc	México	PS	240		
Geminis	Panamá	PS	255		
Cape Hatteras	Unknown—Desconocido	PS	1,805		
Mar Cantabrico	Unknown—Desconocido	PS	222		

TABLE 3. Preliminary estimates of the retained catches of tunas in the EPO from January 1 through December 31, 2005, by species and vessel flag, in metric tons.
TABLA 3. Estimaciones preliminares de las capturas retenidas de atunes en el OPO del 1 de enero al 31 de diciembre 2005, por especie y bandera del buque, en toneladas métricas**.**

Flag	**Yellowfin**	**Skipjack**	**Bigeye**	**Pacific bluefin**	**Bonitos (*Sarda* spp.)**	**Albacore**	**Black skipjack**	**Other[1]**	**Total**	**Percentage of total**
Bandera	**Aleta amarilla**	**Barrilete**	**Patudo**	**Aleta azul del Pacífico**	**Bonitos (*Sarda* spp.)**	**Albacora**	**Barrilete negro**	**Otras[1]**	**Total**	**Porcentaje del total**
Ecuador	42,393	138,307	24,003	-	40	-	95	199	205,037	34.4%
México	105,128	38,949	15	4,545	201	-	1,019	153	150,010	25.1%
Panamá	32,956	27,792	8,976	-	-	-	8	12	69,744	11.7%
Venezuela	45,880	14,302	119	-	-	-	41	2	60,344	10.1%
Other—Otros[2]	47,168	47,691	16,358	-	-	-	20	-	111,237	18.7%
Total	273,525	267,041	49,471	4,545	241	-	1,183	366	596,372	

1 Includes other tunas, mackerel, sharks, and miscellaneous fishes
1 Incluye otros túnidos, caballas, tiburones, y peces diversos
2 Includes Colombia, El Salvador, Guatemala, Honduras, Nicaragua, Spain, United States, and Vanuatu; this category is used to avoid revealing the operations of individual vessels or companies.
2 Incluye Colombia, El Salvador, España, Estados Unidos, Guatemala, Honduras, Nicaragua, y Vanuatú; se usa esta categoría para no revelar información sobre faenas de buques o empresas individuales

TABLE 4. Logged catches and catches per day's fishing[1] (CPDF) of yellowfin in the EPO, in metric tons, during the period of January 1 - September 30, based on fishing vessel logbook information.

TABLA 4. Captura registrada y captura por día de pesca[1] CPDP) de aleta amarilla en el OPO, en toneladas métricas, durante el período de 1 de enero - 30 de septiembre, basado en información de los cuadernos de bitácora de buques pesqueros.

Area	**Fishery statistic**	**Year-Año**					
	Estadística de pesca	**2000**	**2001**	**2002**	**2003**	**2004**	**2005[2]**
Purse seine—Red de cerco							
North of 5°N	Catch—Captura	67,300	71,800	94,000	105,700	60,300	47,200
Al norte de 5°N	CPDF—CPDP	12.2	18.6	21.8	18.4	10.6	10.5
South of 5°N	Catch—Captura	61,100	53,200	28,900	29,200	41,600	24,400
Al sur de 5°N	CPDF—CPDP	6.3	7.5	4.3	4.3	6.0	4.6
Total	Catch—Captura	128,400	125,000	122,900	134,900	101,900	71,600
	CPDF—CPDP	9.4	13.9	17.6	15.4	8.7	8.5
Annual total Total anual	Catch—Captura	157,600	148,900	149,400	162,700	117,600	
Pole and line—Cañero							
Total	Catch—Captura	1,500	2,400	400	100	900	200
	CPDF—CPDP	2.3	3.2	1.4	.7	3.1	4.2
Annual total	Catch—Captura	2,200	3,300	800	500	1,800	

[1] Purse-seiners, Class-6 only; all pole-and-line vessels. The catch values are rounded to the nearest 100, and the CPDF values to the nearest 0.1.

[1] Cerqueros de las Clase 6; todos buques cañeros. Se redondean los valores de captura al 100 más cercano, y los de CPDP al 0.1 más cercano.

[2] Preliminary

[2] Preliminar

TABLE 5. Logged catches and catches per day's fishing[1] (CPDF) of skipjack in the EPO, in metric tons, during the period of January 1 - September 30, based on fishing vessel logbook information.
TABLA 5. Captura registrada y captura por día de pesca[1] (CPDP) de barrilete en el OPO, en toneladas métricas, durante el período de 1 de enero - 30 de septiembre, basado en información de los cuadernos de bitácora de buques pesqueros.

Area	Fishery statistic Estadística de pesca	Year-Año 2000	2001	2002	2003	2004	2005[2]
		Purse seine—Red de cerco					
North of 5°N	Catch—Captura	14,700	8,800	7,400	21,200	13,800	21,000
Al norte de 5°N	CPDF—CPDP	2.7	2.3	1.7	3.7	2.4	4.6
South of 5°N	Catch—Captura	104,400	46,200	50,700	65,800	47,500	55,100
Al sur de 5°N	CPDF—CPDP	10.8	6.5	7.5	9.7	6.8	10.4
Total	Catch—Captura	119,100	55,000	58,100	87,000	61,300	76,100
	CPDF—CPDP	9.8	5.8	6.8	8.2	5.8	8.8
Annual total Total anual	Catch—Captura	129,200	71,300	67,900	115,600	86,200	
		Pole and line—Cañero					
Total	Catch—Captura	100	100	500	200	500	<100
	CPDF—CPDP	.2	.2	1.7	2.5	1.7	1.0
Annual total	Catch—Captura	100	300	500	500	500	

[1] Purse-seiners, Class-6 only; all pole-and-line vessels. The catch values are rounded to the nearest 100, and the CPDF values to the nearest 0.1.
[1] Cerqueros de las Clase 6; todos buques cañeros. Se redondean los valores de captura al 100 más cercano, y los de CPDP al 0.1 más cercano.
[2] Preliminary
[2] Preliminar

TABLE 6. Logged catches and catches per day's fishing[1] (CPDF) of bigeye in the EPO, in metric tons, during the period of January 1 - September 30, based on purse-seine vessel log-book information.
TABLA 6. Captura registrada y captura por día de pesca[1] (CPDP) de patudo en el OPO, en toneladas métricas, durante el período de 1 de enero - 30 de septiembre, basado en información de los cuadernos de bitácora de buques cerqueros.

Fishery statistic—Estadística de pesca	Year—Año					
	2000	2001	2002	2003	2004	2005[2]
Catch—Captura	60,400	24,200	17,000	17,400	17,400	12,200
CPDF—CPDP	5.8	3.2	2.3	2.1	2.0	1.8
Total annual catch—Captura total anual	64,800	31,500	21,000	26,000	28,500	

[1] Class-6 vessels only. The catch values are rounded to the nearest 100, and the CPDF values to the nearest 0.1.
[1] Buques de las Clase 6 solamente. Se redondean los valores de captura al 100 más cercano, y los de CPDF al 0.1 más cercano.
[2] Preliminary
[2] Preliminar

TABLE 7. Catches of bigeye tuna in the eastern Pacific Ocean during 2005 by longline vessels.
TABLA 7. Captures de atún patudo en el Océano Pacífico oriental durante 2005 por buques palangreros.

Flag	Quarter				Month			Fourth quarter	Total
	1	2	3	1-3	10	11	12		
Bandera	**Trimestre**				**Mes**			**Cuarto trimestre**	**Total**
	1	**2**	**3**	**1-3**	**10**	**11**	**12**		
China	633	288	51	972					972
Japan—Japón	4,094	3,842	4,628	12,204	1,099	1,095		2,194	14,398
Republic of Korea—República de Corea	3,035	3,253	2,540	8,828	762			762	9,590
Chinese Taipei—Taipei Chino	1,224	1,544	2,110	4,878	632			632	5,510
Vanuatu	337	214	97	648	42	27	23	92	740
Total	9,323	8,781	9,426	27,580					31,209

TABLE 8. Preliminary data on the sampling coverage of trips by vessels with capacities greater than 363 metric tons by the observer programs of the IATTC, Ecuador, the European Union, Mexico, Venezuela, and the Forum Fisheries Agency (FFA) during the fourth quarter of 2005. The numbers in parentheses indicate cumulative totals for the year.
TABLA 8. Datos preliminares de la cobertura de muestreo de viajes de buques con capacidad más que 363 toneladas métricas por los programas de observadores de la CIAT, Ecuador, México, el Unión Europea, Venezuela, y el Forum Fisheries Agency (FFA) durante el cuarto trimestre de 2005. Los números en paréntesis indican totales acumulados para el año.

Flag	Trips		Observed by program								Percent observed	
			IATTC		National		FFA		Total			
Bandera	Viajes		Observado por programa								Porcentaje observado	
			CIAT		Nacional		FFA		Total			
Colombia	10	(48)	4	(30)	6	(18)			10	(48)	100.0	(100.0)
Ecuador	73	(323)	48	(214)	25	(109)			73	(323)	100.0	(100.0)
España—Spain	4	(20)	4	(19)	0	(1)			4	(20)	100.0	(100.0)
Guatemala	0	(4)	0	(4)					0	(4)	100.0	(100.0)
Honduras	6	(20)	6	(20)					6	(20)	100.0	(100.0)
México	27	(216)	12	(109)	15	(107)			27	(216)	100.0	(100.0)
Nicaragua	4	(20)	4	(20)					4	(20)	100.0	(100.0)
Panamá	27	(99)	25	(94)	2[3]	(50)[3]			27	(99)	100.0	(100.0)
El Salvador	4	(18)	4	(18)					4	(18)	100.0	(100.0)
U.S.A.—EE.UU.	0	(4)	0	(4)					0	(4)	100.0	(100.0)
Venezuela	12	(88)	7	(46)	5	(42)			12	(88)	100.0	(100.0)
Vanuatu	3	(12)	3	(12)					3	(12)	100.0	(100.0)
Total	170	(872)[1,2]	117	(590)	53	(282)			170	(872)	100.0	(100.0)

[1] Includes 53 trips (40 by vessels with observers from the IATTC program and 13 by vessels with observers from the national programs) that began in late 2004 and ended in 2005
[1] Incluye 53 viajes (40 por observadores del programa del CIAT y 13 por observadores de los programas nacionales) iniciados a fines de 2004 y completados en 2005
[2] All fishing activity during two of these trips occurred west of 150°W.
[2] Todas las actividades de pesca durante dos de estos viajes ocurrieron al oeste de 150°O.
[3] Sampled by the Venezuelan national program. It was not known at the time that the four vessels had changed flag from Venezuela to Panama just prior to their trip departures.
[3] Muestreado por el programa nacional venezolano. No se supo en ese momento que cuatro buques habían cambiado de pabellón de Venezuela a Panamá justo antes de comenzar sus viajes.

TABLE 9. Oceanographic and meteorological data for the Pacific Ocean, July-December 2005. The values in parentheses are anomalies. SST = sea-surface temperature; SOI = Southern Oscillation Index; NOI* = Northern Oscillation Index.

TABLA 9. Datos oceanográficos y meteorológicos del Océano Pacífico, Julio-Diciembre 2005. Los valores en paréntesis son anomalías. TSM = temperatura superficie del mar; IOS = Índice de Oscilación del Sur; ION* = Índice de Oscilación del Norte.

Month—Mes	**7**	**8**	**9**	**10**	**11**	**12**
SST—TSM, 0°-10°S, 80°-90°W (°C)	21.2 (-0.6)	20.6 (-0.2)	19.7 (-0.8)	19.7 (-1.2)	20.5 (-1.2)	22.2 (-0.7)
SST—TSM, 5°N-5°S, 90°-150°W (°C)	26.0 (0.4)	25.2 (0.2)	24.6 (-0.3)	24.7 (-0.2)	24.3 (-0.7)	24.2 (-0.9)
SST—TSM, 5°N-5°S, 120°-170°W (°C)	27.5 (0.5)	26.9 (0.2)	26.6 (0.0)	26.8 (0.2)	26.4 (-0.1)	25.9 (-0.6)
SST—TSM, 5°N-5°S, 150W°-160°E (°C)	29.1 (0.5)	28.9 (0.4)	28.8 (0.4)	28.9 (0.5)	28.7 (0.3)	28.9 (0.5)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W (m)	40	50	50	50	50	45
Thermocline depth—Profundidad de la termoclina, 0°, 110°W (m)	40	40	40	40	40	40
Thermocline depth—Profundidad de la termoclina, 0°, 150°W (m)	120	130	130	140	130	130
Thermocline depth—Profundidad de la termoclina, 0°, 180°W (m)	160	170	160	170	170	180
Sea level—Nivel del mar, Baltra, Ecuador (cm)	193.8 (13.3)	184.2 (6.5)	183.9 (6.6)	187.8 10.6	189.4 (10.5)	182.4 (2.6)
Sea level—Nivel del mar, Callao, Perú (cm)	- -	- -	99.8 (-6.2)	101.6 (-4.0)	109.0 (2.1)	98.6 (-10.0)
SOI—IOS	0.0	-0.8	0.4	1.1	-0.3	-0.2
SOI*—IOS*	0.76	-2.91	3.64	4.97	0.80	0.24
NOI*—ION*	-0.20	-0.76	3.34	2.17	3.33	-1.89